

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method of processing a series of frames for displaying on a display having a first modulator disposed to illuminate a second modulator, the method comprising:
  - (a) receiving a key frame of image data and designating the frame as a key frame;
  - (b) based on the image data for the key frame, calculating a key frame first modulation signal based on the key frame image for controlling a plurality of controllable elements of the first modulator to provide a spatially-varying light pattern on the second modulator;
  - (c) based on the key frame first modulation signal, calculating a key frame luminance map indicative of the intensity of light that would be incident at points on the second modulator if the first modulator were driven according to the key frame first modulation signal corresponding to light incident on the second modulator when the first modulator is driven by the key frame first modulation signal; and,
  - (d) for each of a plurality of frames in the series of frames:
    - (i) receiving a current frame image; based on image data for the frame and on the key frame luminance map, determining a frame second modulation signal for controlling elements of the second modulator to reproduce an image specified in the image data for the frame; and,

(ii) determining a current frame second modulation signal based on the current frame image and the key frame luminance map; and,

(iii) selecting the key frame first modulation signal and the frame second modulation signal to be a current frame first modulation signal applied respectively to the first and second modulators to display the image specified by the image data for the frame.

2. (Currently amended) A method according to claim 1 wherein step (d) comprises:

(iv) comprising returning to step (a) after the plurality of frames step (d).

3. (Withdrawn) A method according to claim 2 wherein the plurality of frames comprises a predetermined number of frames.

4. (Currently amended) A method according to claim 2 wherein calculating the current frame second modulation signal comprises comprising:

comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis; and,

updating the key frame first modulation signal and key frame luminance map if the pixels of the current frame second modulation signal are outside the second modulator range for a threshold number of pixels.

5. (Currently amended) A method according to claim 4 wherein updating the key frame first modulation signal and key frame luminance map comprises:

updating portions of the key frame first modulation signal and key frame luminance map which ~~effect affect~~ pixels for which the ~~current~~ frame second modulation signal is outside the second modulator range.
6. (Currently amended) A method according to claim 4 wherein updating the key frame first modulation signal and key frame luminance map comprises:

~~calculating recalculating~~ the key frame first modulation signal ~~using the current frame image as the key frame image based on the image data for the frame;~~ and

~~calculating an approximation of the key frame luminance map based on the recalculated key frame first modulation signal.~~
7. (Withdrawn) A method according to claim 4 wherein updating the key frame first modulation signal and key frame luminance map comprises:

selecting a standard key frame first modulation signal and luminance map for use as interim key frame parameters; and,

updating the key frame first modulation signal and key frame luminance map while at least one current frame is being processed with the interim key frame parameters.
8. (Withdrawn) A method according to claim 7 wherein the standard key frame comprises a frame wherein the first modulator is driven at a constant percentage of full intensity across a display area.

9. (Withdrawn) A method according to claim 7 wherein the standard key frame comprises a frame wherein the first modulator is driven at full intensity across a display area.
10. (Withdrawn) A method according to claim 7 wherein the standard key frame comprises a frame wherein the first modulator is driven at a constant percentage of full intensity across a selected portion of a display area.
11. (Withdrawn) A method according to claim 7 wherein the standard key frame comprises a frame wherein the first modulator is driven at full intensity across a selected portion of a display area.
12. (Withdrawn) A method according to claim 7 wherein the standard key frame comprises a previously processed key frame.
13. (Currently amended) A method according to claim 2 ~~wherein calculating the current frame second modulation signal comprises comprising:~~  
comparing a plurality of pixels of the ~~current~~ frame second modulation signal with a second modulator range on a pixel by pixel basis; and,  
updating the key frame first modulation signal and key frame luminance map if an average amount by which the pixels of the ~~current~~ frame second modulation signal are outside the second modulator range exceeds a predetermined threshold.

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14. (Currently amended) A method according to claim 2 wherein calculating the current frame second modulation signal comprises comprising:

comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis; and,

updating the key frame first modulation signal and key frame luminance map if a cumulative amount by which the pixels of the current frame second modulation signal are outside the second modulator range exceeds a predetermined threshold.

15. (Currently amended) A method according to claim 2 wherein calculating the current frame second modulation signal comprises comprising:

comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis; and,

updating the key frame first modulation signal and key frame luminance map if an amount by which at least one of the pixels of the current frame second modulation signal is outside the second modulator range exceeds a predetermined threshold.

16. (Currently amended) A method according to claim 2 comprising receiving image data for at least one frame to be used as a future key frame image and calculating a future key frame first modulation signal and corresponding luminance map while the plurality of frames are is being processed.

17. (Currently amended) A method according to claim 1 wherein calculating the current frame second modulation signal comprises comprising:
  - comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis; and,
  - updating the key frame first modulation signal and key frame luminance map if the pixels of the current frame second modulation signal are outside the second modulator range for a threshold number of pixels.
18. (Currently amended) A method according to claim 17 wherein updating the key frame first modulation signal and key frame luminance map comprises:
  - updating portions of the key frame first modulation signal and key frame luminance map which effect affect pixels for which the current frame second modulation signal is outside the second modulator range.
19. (Currently amended) A method according to claim 17 wherein updating the key frame first modulation signal and key frame luminance map comprises:
  - calculating recalculating the key frame first modulation signal using the current frame image as the key frame image based on the image data for the frame; and
  - calculating an approximation of the key frame luminance map based on the recalculated key frame first modulation signal.
20. (Withdrawn) A method according to claim 17 wherein updating the key frame first modulation signal and key frame luminance map comprises:

selecting a standard key frame first modulation signal and luminance map for use as interim key frame parameters; and,

updating the key frame first modulation signal and key frame luminance map while at least one current frame is being processed with the interim key frame parameters.

21. (Withdrawn) A method according to claim 20 wherein the standard key frame comprises a frame wherein the first modulator is driven at a constant percentage of full intensity across a display area.
22. (Withdrawn) A method according to claim 20 wherein the standard key frame comprises a frame wherein the first modulator is driven at full intensity across a display area.
23. (Withdrawn) A method according to claim 20 wherein the standard key frame comprises a frame wherein the first modulator is driven at a constant percentage of full intensity across a selected portion of a display area.
24. (Withdrawn) A method according to claim 20 wherein the standard key frame comprises a frame wherein the first modulator is driven at full intensity across a selected portion of a display area.
25. (Withdrawn) A method according to claim 20 wherein the standard key frame comprises a previously processed key frame.

26. (Currently amended) A method according to claim 17 wherein calculating the current frame second modulation signal comprises: comprising  
comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis; and,  
updating the key frame first modulation signal and key frame luminance map if an average amount by which the pixels of the current frame second modulation signal are outside the second modulator range exceeds a predetermined threshold.

27. (Currently amended) A method according to claim 17 wherein calculating the current frame second modulation signal comprises: comprising  
comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis; and,  
updating the key frame first modulation signal and key frame luminance map if a cumulative amount by which the pixels of the current frame second modulation signal are outside the second modulator range exceeds a predetermined threshold.

28. (Currently amended) A method according to claim 17 wherein calculating the current frame second modulation signal comprises: comprising  
comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis; and,  
updating the key frame first modulation signal and key frame luminance map if an amount by which at least one of

the pixels of the current frame second modulation signal is outside the second modulator range exceeds a predetermined threshold.

29. (Currently amended) A method for processing a frame for displaying on a display having a first modulator disposed to illuminate a second modulator, the method comprising:

obtaining image data for a current frame;

retrieving a predetermined luminance map corresponding to a predetermined first modulation signal for the first modulator indicative of the intensity of light that would be incident at points on the second modulator if the first modulator were driven according to a predetermined first modulation signal; and,

determining whether the second modulator is capable of modulating the luminance map to reproduce the on the display an image specified in the image data for of the current frame on the display, and if so, generating a second modulation signal for the second modulator based on the image data for the current frame and the luminance map.

30. (Currently amended) A method for processing a plurality of frames for displaying on a display having a first modulator disposed to illuminate a second modulator, the method comprising:

obtaining image data for the plurality of frames;

based on the image data for a key frame of the plurality of frames, calculating a key frame first modulation signal for the first modulator for controlling a plurality of controllable elements of the first modulator to provide a spatially-varying light pattern on the second

modulator based on the image data for a key frame of the plurality of frames;

based on the key frame first modulation signal,  
calculating a key frame luminance map indicative of the  
intensity of light that would be incident at points on the  
second modulator if the first modulator were driven  
according to the key frame first modulation signal  
corresponding to light incident on the second modulator when  
the first modulator is driven by the key frame first  
modulation signal; and,

generating a second modulation signal for each of the plurality of frames based on the image data for each frame and the key frame luminance map.

31. (Currently amended) A computer program product comprising a medium carrying computer readable instructions which, when executed by a processor, cause the processor to execute a method of processing a series of frames for displaying on a display having a first modulator disposed to illuminate a second modulator, the method comprising:
  - (a) receiving a key frame of image data and designating the frame as a key frame;
  - (b) based on the image data for the key frame, calculating a key frame first modulation signal based on the key frame image for controlling a plurality of controllable elements of the first modulator to provide a spatially-varying light pattern on the second modulator;
  - (c) based on the key frame first modulation signal, calculating a key frame luminance map indicative of the intensity of light that would be incident at points on the second modulator if the first modulator were driven according to the key frame first modulation signal of

light from the first modulator incident on the second modulator; and,

- (d) for each of a plurality of frames in the series of frames:
  - (i) receiving a current frame image, based on image data for the frame and on the key frame luminance map, determining a frame second modulation signal for controlling elements of the second modulator to reproduce an image specified in the image data for the frame; and,
  - (ii) determining a current frame second modulation signal based on the current frame image and the key frame luminance map; and,
  - (iii) selecting the key frame first modulation signal and the frame second modulation signal to be a current frame first modulation signal applied respectively to the first and second modulators to display the image specified by the image data for the frame.

32. (Currently amended) A system for displaying a series of frames on a display having a first modulator disposed to illuminate a second modulator, the system comprising a processor configured to:

- (a) receive a key frame of image data and designating the frame as a key frame;
- (b) calculate a key frame first modulation signal based on the key frame image data for the key frame, for controlling a plurality of controllable elements of the first modulator to provide a spatially-varying light pattern on the second modulator;

- (c) calculate a key frame luminance map indicative of the intensity of light that would be incident at points on the second modulator if the first modulator were driven according to the key frame first modulation signal of light from the first modulator incident on the second modulator;
- (d) determine a key frame second modulation signal based on the key frame image and the key frame luminance map;
- (e) drive the first modulator with the key frame first modulation signal and drive the second modulator with the key frame second modulation signal to generate display the image specified by the image data for the key frame image on the display; and,
- (f) for each of a plurality of other frames in the series of frames:
  - (i) receive a current frame image, based on image data for the frame and on the key frame luminance map, determine a frame second modulation signal for controlling elements of the second modulator to reproduce an image specified in the image data for the frame; and,
  - (ii) determine a current frame second modulation signal based on the current frame image and the key frame luminance map; and,
  - (iii) drive the first modulator with the key frame first modulation signal and drive the second modulator with the current frame second modulation signal to generate display the current frame image specified by the image data for the frame on the display.

33. (New) A method according to claim 1, comprising displaying the series of frames by, for each frame of the series of frames, applying the key frame first modulation signal and the frame second modulation signal respectively to control the first and second modulators to display the image specified by the image data for the frame.